

Case Study of the Carson CCS Project

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Acronyms

AB – Assembly bill

CalEPA – California Environmental Protection Agency

CARB – California Air Resources Board

CCS – Carbon capture and storage

CEC – California Energy Commission

CO₂ - Carbon dioxide

CSIRO – Commonwealth Scientific and Research Organisation

DOGGR – Division of Oil, Gas, and Geothermal Resources

DWP – Department of Water and Power

EJ - Environmental justice

ENGO – Environmental non-governmental organization

EOR – Enhanced oil recovery

GCCSI - Global CCS Institute

IGCC – Integrated gasification (with) combined cycle

IOGCC – Interstate Oil and Gas Compact Commission

IPCC – Intergovernmental Panel on Climate Change

NODA – Notice of data availability

NRDC – Natural Resources Defence Council

RCSP – Regional Carbon Sequestration Partnership

RPS – Renewable portfolio standards

SCAQMD – South Coast Air Quality Management District

UIC – Underground injection control

UNFCCC – United Nations Framework Convention on Climate Change

US – United States

USEPA – United States Environmental Protection Agency

USDOE – United States Department of Energy

WESTCARB – West Coast Regional Carbon Sequestration Partnership

Executive summary

In February 2006, BP announced plans to construct and operate a commercial hydrogen power plant in Carson, California. Carbon dioxide would be captured at the plant and piped to a location in nearby oilfields for enhanced oil recovery (EOR) that would result in carbon dioxide storage. Combined, this is referred to as the Carson Project.

At the time of the announcement, the decision had not been made as to where the carbon dioxide EOR and storage would take place. Finalising this decision proved technically challenging in the area first announced as the intended location and, in mid- to late- 2007, the project 'stood down' while work to finalise the location for carbon dioxide EOR and storage was resolved. In the interim, opposition had begun to surface in relation to proposed legislation regarding storage regulation and the Carson Project.

In mid-2008, the trade press reported that a new partnership was filing an application permit for a hydrogen power plant with CCS related to EOR in the Kern County area. By May 2009, the local media reported that the Carson Project had been "quietly abandoned". Primary reasons cited by BP for the change in venue were business reasons stemming from the complicated ownership of the nearby oilfield and costs of constructing a pipeline to other suitable locations further away. The purpose of this case study is to review the communication activities that took place in relation to the proposed Carson Project and to identify key lessons learned about communicating future carbon sequestration projects.

1 Introduction and overview

This case study examines the plan to implement a power plant with carbon capture and storage (CCS), which was announced by BP in February 2006. The project involved two components: a first-of-its kind commercial hydrogen power plant to be built in Carson, California, and planned storage of the carbon dioxide in nearby oilfields.

The purpose of the study is to identify key lessons learned in communicating about future sequestration projects. It is one of five studies of individual sequestration projects coordinated by CSIRO and funded by the GCCSI.

The case study is presented in five sections. Following this overview, Section 1 outlines the methodology and briefly describes the project and its location. Section 2 provides the background that outlines the national and state political context of CCS, with a focus on the factors that affected project deployment. Key stakeholders and issues are identified in Section 3. Section 4 describes the media portrayal of the project and summarises the communication approach. A final section draws on the previous analyses to critique the communication and public engagement approach and highlight the factors that affected the project outcome. A detailed summary of the national context, which formed the basis for the discussion in Section 2, is provided in Appendix 1 and the interview protocol is included in Appendix 2.

1.1 Methodology

Data for the study were drawn from secondary and primary sources. Secondary data were used to develop a background picture of the project in preparation for the interviews and then again to provide a fuller case study description when writing the report. These data included a wide range of government documents, including legislative and regulatory documents and analyses available through the internet. Additional secondary sources included presentations, letters, websites, and media reports, including news releases.

Primary data were gathered in a series of interviews with representatives of stakeholder groups knowledgeable about the project, using a protocol common to all five case studies (see Appendix 2). They included members of the project team, local government and national environmental groups. Representatives from local and state-based environmental justice (EJ) groups who had been active in the debate over legislation related to carbon storage and the project declined to be interviewed.

1.2 Project description

The proposed Carson Project, announced in February 2006, was to be a commercial, hydrogen power plant project designed to generate baseload power and capture and store 90 per cent of its carbon dioxide. It was introduced by its joint developers, BP and Edison Mission Energy, as a 'first-of-its-kind' 500 megawatt hydrogen-based power plant to produce low-carbon electricity, powering 325,000 Californian homes.

The project would have been a low-carbon facility in several ways. It would have used a petroleum by-product (known as petroleum coke or pet coke) from existing nearby refineries, which would be burned to produce hydrogen. This would result in the cleaner treatment of pet coke. The current treatment involved shipping the pet coke to China where it was used as a fuel to generate electricity. Several studies showed that because China was not requiring emissions controls, the emissions from the pet coke combustion could actually be tracked back to California. It would also have eliminated marine and truck emissions from the current pet coke transportation to China. In addition, the proposed plant would have captured four million short tons of carbon dioxide a year that would otherwise have been emitted to the atmosphere. Plans were under discussion to transport the captured carbon dioxide by pipeline to nearby oilfields for enhanced oil recovery (EOR) operations.¹ In the EOR process, carbon dioxide is injected into mature oilfields to mobilise oil that would otherwise be unrecoverable. Today more than 35 million tons of carbon dioxide is used for EOR in the United States.

¹ BP Energy and Edison Mission Group Plan Major Hydrogen Power Project for California, Media release, 10 February 2006. www.bp.com/hydrogenpower/

1.3 Location ²

The power plant was to be located in the City of Carson in an industrial area next to BP/Arco and other existing oil refineries, just west of the Terminal Island Freeway. This location would benefit from being near the needed supplies of pet coke and recycled industrial wastewater. It would need only the addition of pipelines to transport the carbon dioxide and finalisation of the carbon dioxide EOR and storage location, as well as construction of the facility.

Initial planning focused on the advantages of the Carson location because of its proximity to the feedstock and end-users of the electric power; there was less concern about finalising the location for carbon dioxide storage. The option of running a relatively short (about 16 km / 10 miles) pipeline south to Long Beach was favored over other options including running a 160 km (100 miles) pipeline through Beverly Hills to potential storage locations north of Los Angeles. These locations, where EOR is common practice, were expected to provide depleted oilfields with sufficient storage capacity. Accordingly, carbon dioxide storage was tentatively planned to be located in the Wilmington Oil Field, a large petroleum field that runs south-east to north-east through Long Beach in the Los Angeles Basin, about 8 to 16 km (5 to 10 miles) away. It is the largest oilfield in the United States, and with 90 per cent of its original reserves recovered, it was a likely location for using carbon dioxide to recover otherwise stranded oil.

Carson is 20 km (13 miles) south of downtown Los Angeles and is bordered by Long Beach on the east and Wilmington on the south (see Figure 1). The city is a part of what is known as the South Bay region of the southwest peninsula of Los Angeles County, stretching along the southern shores of the Santa Monica Bay south of LAX airport and west of Long Beach. It is one of the most culturally, economically and ethnically diverse areas in the United States. The area is highly industrialised, with the petroleum refining, aerospace and automobile industries and the Port of Los Angeles the major sources of employment. Air pollution from the oil refineries has long been a concern of activists and politicians.

Census data for the year 2000 showed the city of Carson, where the power plant was to be located, had a population of 89,730. The population, as reported in the Census data, was very diverse: 29 per cent white, 24.4 per

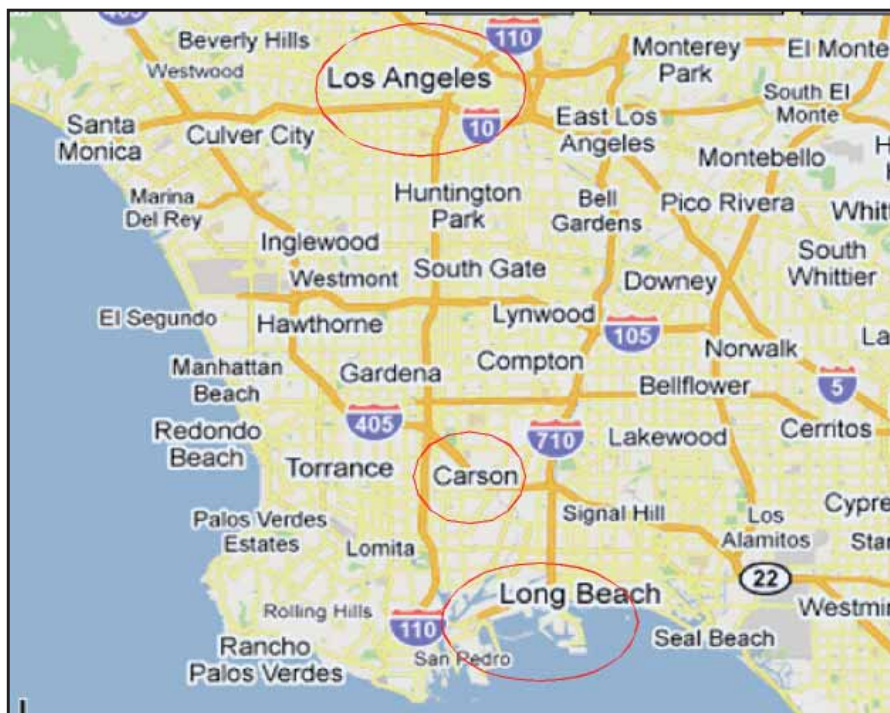


Figure 1. Greater Los Angeles Area (Google Maps 2010)

² The narrative descriptions in this section of Carson, Long Beach and the South Bay area are based on information in Wikipedia, http://en.wikipedia.org/wiki/South_Bay_Los-Angeles

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cent African American, 22.3 per cent Asian, 3 per cent Pacific Islanders, 0.6 per cent Native American; 18 per cent from other races and almost 35 per cent who were Hispanic or Latino of any race. The population density was high (about 11,900 per square km / 4,762 per square mile) and family household median income was US\$60,457.

The carbon dioxide was to be piped to a portion of the Wilmington reservoir that was operated by Occidental Petroleum Company in the Long Beach Area. The 2000 Census population of Long Beach was 461,522 – much larger than Carson. That population was also diverse and reportedly the most ethnically diverse large city in the United States. Compared with Carson, the population was composed of fewer white and more African American people and more Hispanics and Latin Americans; median household income was notably lower at US\$37,270. In 2005, the Port of Long Beach was the second busiest seaport in the US. The combined operations of the Port of Long Beach and the Port of Los Angeles are the busiest in the country, serving shipping to and from the Pacific Rim, and the region has a complex road and rail network. Nearby Wilmington is a relatively small community, and although it was incorporated in 1886,³ its census data is included in county statistics. A community database for a California real estate website estimated the 2010 population at 53,308, with 13,966 households and median income of US\$30,259.⁴

As the site of the power generation facility, Carson stood to gain the lion's share of employment, which was estimated by the project sponsors at 1,000 construction and 150 permanent jobs. It was also financially very attractive to the city, which would receive the tax increment accruing from a location in a redevelopment zone. By improving a deteriorated area, the city could claim increased tax revenues resulting from increased property values.⁵ The plant was located in an industrial area bordered by Wilmington and the western part of Long Beach. As indicated in Figure 2, residents of these two communities would be equally close to the facility as residents of Carson.

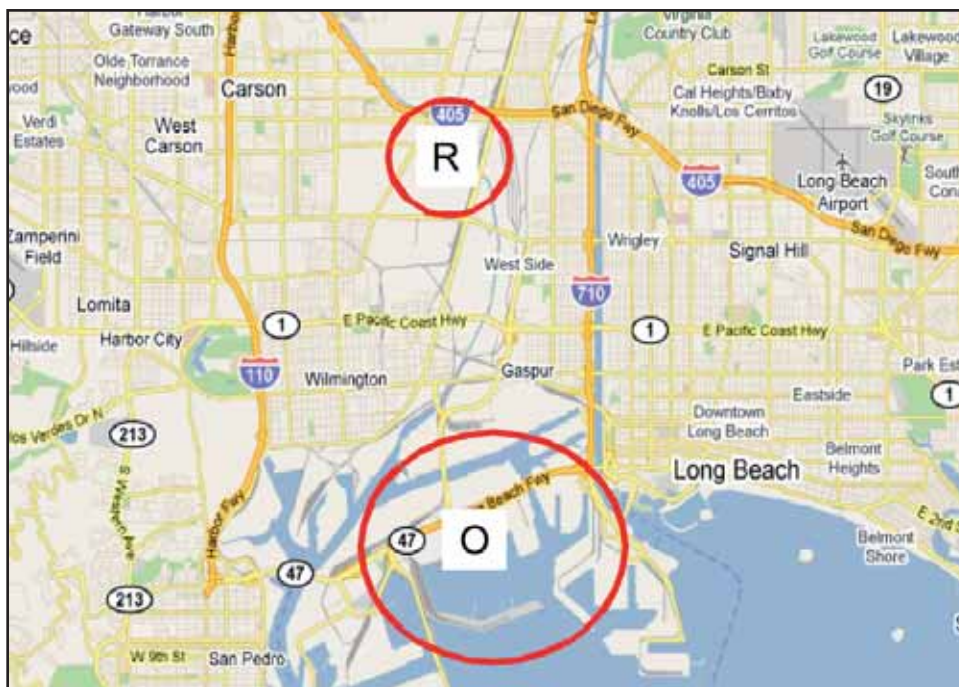


Figure 2. Detailed view of Carson indicating the general location (R) of the refinery and the general location (O) of the oil fields

³ Historical US Census Populations of Places, Towns, and Cities in California, Compiled by California Department of Finance, accessed August 2010 at: http://www.dof.ca.gov/research/demographic/reports/census-surveys/historical_1850-2000/documents/calhist2.xls

⁴ Fizber.com, City Profile – Wilmington, accessed online August, 2010 at: <http://www.fizber.com/sale-by-owner-home-services/california-city-wilmington-profile.html>

⁵ Redevelopment agencies do not levy taxes and do not have the ability to raise taxes. However, State law allows redevelopment agencies to pledge tax increments so that they can repay bonds and other types of debt incurred to make investments in project areas. In essence, redevelopment agencies fund themselves to make improvements to their communities. They stimulate increases in property values that otherwise would not have occurred. See <http://calredvelop.org/AM/Template.cfm?Section=Home&CONTENTID=5860&TEMPLATE=/CM/ContentDisplay.cfm>

1.4 Planned timeline

The project was announced in February 2006, and construction was scheduled to begin in late 2011 or early 2012. The initial plan was to apply for permits relevant to the power plant and carbon dioxide storage project in late 2006, but that date quickly slipped to 2007. One of the main reasons for the delay was that the location for the storage project had not been finalised. In mid- to late- 2007, the project 'stood down' while efforts were focused on finalising a location for the storage. During that period, the project team informed local decision-makers that potential alternative locations were being considered but did not issue a formal public announcement. In mid-2008, the trade press reported that a new partnership was filing an application permit for a hydrogen power plant with CCS related to EOR in the Kern County area. Finally, in May 2009 a report that the project had been "quietly abandoned" appeared in the local Long Beach media. In an interview, BP said that primary reasons for halting the Carson Project were business reasons stemming from the complicated ownership of the oilfield, leading to a lack of commitment to purchase the carbon dioxide. The alternatives remaining included very long pipelines through populated areas which, while technically feasible, would be costly and unpopular. An Occidental Petroleum spokesperson reported that the company's geologists "determined that the Wilmington Field was not amenable to a flood of carbon dioxide."⁶ The Carson Project, as originally conceived, had been cancelled.

2 Background

The Carson Project was announced at a pivotal time in the public discourse on climate change and CCS nationally, within the states, and within California – and indeed, at the global level. Even among those working for aggressive actions to be undertaken to reduce greenhouse gas emissions, CCS was a controversial topic, some arguing that CCS would simply extend the era of fossil fuel use.

2.1 National context of CCS

Within the United States, there were several facets to the public discussion of CCS. Chief among these was the question of whether the country would adopt meaningful policies to address climate change. This set the stage for strategic responses to CCS. To underscore the value of this metaphor, a more detailed history of developments in climate policy and regulations as well as the response by key stakeholder groups is included in Appendix 1.

2.1.1 Political activity

Climate change evolved into a potent political topic in the United States during the 1990s. The country played an important role negotiating firm emission targets and market mechanisms in the United Nations Framework Convention on Climate Change's (UNFCCC) Kyoto Protocol. At the same time, the US senate expressed concern that the nation not adopt the Kyoto Protocol greenhouse gas targets if the developing world did not also adopt targets and/or if the cost of meeting the targets would harm the economy. This set of events characterised a growing divide in political opinion over climate change: some fervently believe it is a problem that needs to be addressed throughout the economy and others believe, just as fervently, that it is not a problem and/or that we cannot afford to address it. As described in Appendix 1, a series of political events has largely polarised the discussion of climate change so that today, efforts to defeat or promote climate change policy may appear more symbolic of loyalty to political party ideals than to science. In the absence of setting clear climate change policy, congressional activity has supported significant efforts in research and development of technologies that have the dual benefits of contributing to energy security and potentially addressing climate change.

2.1.2 Regulatory developments

As CCS gained prominence as a potential option for addressing climate change, the issue of regulatory oversight of carbon dioxide (CO₂) storage also gained prominence. At the heart of the discussion was a concern over who would regulate carbon dioxide storage, how stringent the regulations would be, and whether efforts to regulate CO₂ injection for sequestration would interfere with the business of EOR using CO₂. The US Environmental Protection Agency (USEPA) convened an internal work group in 2005 to review CCS and subsequently issued guidance for the

⁶ "Plans for Carson 'green' power plant are dropped," *Daily Breeze*, May 17, 2009

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permitting of early sequestration pilot projects. Importantly, USEPA did not indicate how it would regulate large-scale injection projects at this time. Thus, during the active period for the Carson Project, it was not clear if, how, or when USEPA would establish a regulatory framework specifically for carbon dioxide storage. Lack of regulatory certainty led to different reactions from stakeholders. In the national discussion about regulations that was occurring, some believed that the existing regulatory framework was sufficient to allow early projects to move ahead safely; others believed strongly that regulators were not prepared to ensure that large projects would protect public safety. The topic of whether to develop regulations became a contentious federal issue.

2.1.3 Regulatory developments – other states

In the aftermath of an uncertain landscape for federal climate change policy in the United States, many states initiated climate change policy activities. California, as discussed in the next section, was in the forefront of those states actively adopting policies to curb greenhouse gas emissions and about 20 other states adopted programs that directly addressed climate change through reduction requirements or incentives. One of these states, Washington, adopted rules that required all new power plants to meet an emission performance standard that was roughly equivalent to the emission from new natural gas power plants, and at the same time the state passed rules enabling new plants to meet this standard using CCS. In addition, more than 20 states adopted policies that required or strongly encouraged the development of renewable energy and energy efficiency programs (e.g. renewable portfolio standards, alternative energy portfolio standards). Importantly, during this timeframe, New Jersey passed a law classifying CO₂ as a contaminant and several states (e.g. Kansas) rejected bids to develop new power plants that did not address climate change.

The states were also very active with regard to CCS. Some were more focused on the environmental protection aspects of CCS and others expanded their focus to include issues that arose out of commercial development of natural resources. By 2006, there was a growing discussion about several issues including property rights, liability and regulatory authority. A key issue arose over whether CCS would be regulated as an environmental protection concern (typically administered by a federal or state environmental protection agency) or a resource management concern (typically administered by a state oil and gas agency).

2.1.4 Other national stakeholder groups

At the national level, several key stakeholders, including environmental groups, industry and the Department of Energy, were actively pursuing issues related to CCS.

Large, well-known environmental groups play an important role in helping to shape public opinion, and in 2005 they were sending mixed signals about CCS.⁷ Some large groups, for instance, Natural Resources Defense Council seemed to view CCS as a necessary tool for addressing climate change. Other large groups, including Greenpeace and the Sierra Club, were more sceptical if not outright opposed to CCS, seeing it as a deterrent to moving rapidly to a renewable energy-based economy.

At the same time, 'industry' was actively involved in studying CCS but the conventional wisdom was that it would not be deployed in the near term. Many in the power generation industry cited the fact that carbon capture had not been applied at large scale. Both the oil industry and the power industry expressed concern about the uncertainty of using saline reservoirs for storage, and the oil industry was protective of the enhanced oil recovery business. All were focused on the high cost of CCS. Given this profile, it is easy to see how some stakeholders might perceive efforts involving industry to develop CCS and other advanced climate technologies, such as the hydrogen car, as not very serious.

At the time of the proposed Carson Project, federal action to encourage commercial deployment had begun. Under a US Department of Energy (USDOE) regional partnership program, seven regional partnerships had been established in 2003. About 20 regional demonstration projects were scheduled nationwide, beginning in 2005. Although these were primarily small-scale tests sequestering a few thousand tons, their activities served to increase awareness and involvement by a wide range of stakeholders. Among these was the West Coast Regional Carbon Sequestration Partnership (WESTCARB), which included California among its partner states.

⁷Stephens, J., Growing Interest in Carbon Capture and Storage (CCS) for Climate Change Mitigation, Sustainability: Science, Practice, and Policy, Fall 2006, Volume 2, Issue 2, <http://ejournal.nbil.org/archives/vol2iss2/0604-016.stephens.html>

2.2 Context of CCS in California

California is home to some of the most diverse, ecologically sensitive areas in the country as well as one of the largest populations. This has led to the paradox that while California has a history of serious environmental concerns it also has some of the most far-reaching environmental measures in the United States. Developments in the California environment, energy and climate arenas provide an important backdrop for considering the Carson Project.

2.2.1 Air quality and the environment ⁸

California has been battling the effects of air pollutants from stationary and mobile sources since the early 1940s. The state was the first to create an air pollution control district, the Los Angeles County Air Pollution Control District, and to establish statewide standards to control the emissions from motor vehicles. Efforts to further control air pollutants, especially from vehicles, have continued since that time. In the 1960s, then Governor Ronald Reagan created the California Air Resources Board (CARB) by merging the California Motor Vehicle Pollution Control Board and the Bureau of Air Sanitation and its Laboratory. In 1976, the South Coast Air Quality Management District (SCAQMD) was created under the auspices of the Lewis Presley Act. The SCAQMD is the agency in charge of controlling air pollution throughout Orange County and the urban portions of Los Angeles, Riverside and San Bernardino counties. As acknowledged by the SCAQMD, it is "the smoggiest region of the US".⁹

To address these air quality concerns, California implemented a series of increasingly tough emission standards for stationary sources, gasoline and diesel-powered vehicles, and fuels during the 1970s, 80s and 90s. Some of these provisions were adopted through CARB to apply throughout California and some were developed in conjunction with SCAQMD as part of the local air quality management plan.

This period was also marked by significant increases in the California population, which increased to about 30 million by 1990. As a result, despite the regulations, various sub-populations within the state continued to experience serious environment-related health problems. In 2000, a California-funded long-term children's health study showed the impact on children's lung function from exposure to high air pollution levels. Shortly after, the state passed standards to significantly reduce harmful particulate matter emissions from diesel-powered equipment, mandate zero-emission vehicles, reduce the impact from controlled burns at agricultural areas, reduce pollution from buses, and achieve other emission reductions. Yet, despite those measures, southern California consistently ranks as the most polluted in the nation, topping the American Lung Association lists for both ozone and particulate pollution. In 2007, Los Angeles ranked 4th and 3rd for long-term particle and ozone pollution respectively.

Since 2000, the American Lung Association has routinely produced a State of the Air report to assess the levels of ground level ozone and short and long-term particulate pollution in metropolitan areas across the country. Beginning with the first report, issued in 2000 but covering the period 1996-1998, air quality problems in the Los Angeles metropolitan area have dominated the rankings as the worst in the country. Los Angeles was rated as having the worst ozone levels in the country for all but a two-year period since 1996, and it was ranked worst for particulate pollution during the period 2000-2006 when the American Lung Association started including an assessment of particulate pollution in its report.¹⁰ These environmental impacts are not limited to sources located in California alone: emissions in Asia have been shown to contribute to pollution problems in California. According to a report by Ramanathan and colleagues in the Journal of Geophysical Research:

On some days, almost a third of the air over Los Angeles and San Francisco can be traced directly to Asia. With it comes up to three-quarters of the black carbon particulate pollution that reaches the West Coast.¹¹

While there may have been a significant benefit in terms of climate change emissions, the Carson Project also represented an incremental increase in conventional pollutants – and conditions in the area were especially ripe for criticism over such increases. First, the area within the SCAQMD was a constrained air shed by the time the

⁸ Information in this section is drawn from: CA.GOV, "History of California's Involvement in Air Pollution and Global Climate Change," accessed June 2010 at: <http://www.climatechange.ca.gov/background/history.html>

⁹ South Coast Air Quality Management District, Home Page, accessed online September 1, 2010 at <http://www.aqmd.gov/Default.htm>

¹⁰ American Lung Association, State of the Air 2010 – History FAQ, found online 3 July 2010 at: http://www.lungusa.org/assets/documents/publications/state-of-the-air/sota2010_report-history.pdf

¹¹ Wall Street Journal, Huge Dust Plumes from China Cause Changes in Climate, 20 July 2007, printed on page B1

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Carson Project moved forward and therefore any additional increments of conventional air pollution would not be allowed without a compensating offset. Further, the area was under pressure to develop a management plan and regulations that would result in additional reductions in conventional pollutants and thereby help to bring the state into compliance with the requirements of the federal Clean Air Act Amendments.

2.2.2 Environmental justice

Concerns about Environmental justice (EJ) also played an important role in the Carson context. EJ had emerged as a national issue in the 1990s, especially in relation to concerns about the disproportionate impact of air pollution on certain populations. A report by the American Lung Association provides background and insight to these concerns:¹²

The burden of air pollution is not evenly shared. Poorer people and some racial and ethnic groups are among those who often face higher exposure to pollutants and who may experience greater responses to such pollution. Scientists have speculated that there are three broad reasons why disparities may exist. First, groups may face greater exposure to pollution because of factors ranging from racism to class bias to housing market dynamics and land costs. For example, pollution sources may be located near disadvantaged communities, increasing exposure to harmful pollutants. Second, low social position may make some groups more susceptible to health threats because of factors related to their disadvantage. Lack of access to health care, grocery stores and good jobs, poorer job opportunities, dirtier workplaces or higher traffic exposure are among the factors that could handicap groups and increase the risk of harm. Finally, existing health conditions, behaviors, or traits may predispose some groups to greater risk. For example, diabetics are among the groups most at risk from air pollutants and the elderly, Blacks/African Americans, Mexican Americans and people living near a central city have higher incidence of diabetes.

EJ concerns became a significant issue nationally and by 1992, the USEPA established its Office of Environmental Equity, and the Work Group on Environmental Equity had finished its report. Legislatively, a number of bills were introduced in Congress, including the *Environmental Justice Act 1992*. On 11 February 1994, President Clinton signed Executive Order 12898: *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop EJ strategies to help federal agencies address disproportionately high and adverse human health or environmental effects of their programs on minority and low-income populations. As a result, USEPA undertook a series of high-profile actions to implement EJ policies at the federal level.¹³

Of note in the Carson context is the 2001 adoption by California of new environmental justice policies. These policies were designed to ensure the fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation and enforcement of environmental laws, regulations and policies.¹⁴ This led to the establishment of a Global Warming Environmental Justice Advisory Committee to suggest ways for the CARB to implement the climate policies of AB 32, the *2006 Global Warming Solutions Act*, while maximising overall social benefits.

2.2.3 Energy

Broader energy issues were also an important factor in the Carson context. In 1974 the state passed the *Warren-Alquist State Energy Resources Conservation and Development Act* which, among other things, created the California Energy Commission (CEC) and directed it to certify the need for a power plant or power plant modification and the suitability of the plant's site before any power plant could be constructed or modified. Two years later this Act was amended to add provisions barring new nuclear plants from being built in the state unless it could be demonstrated that there was sufficient capacity to store spent fuel rods and dispose of nuclear waste in federal depository. The CEC was empowered to consider alternative energy options, including large-scale energy efficiency and renewable energy.

¹³ US EPA, Environmental Justice, Background Information, accessed online at: <http://www.epa.gov/environmentaljustice/basics/ejbackground.html>

¹⁴ Senate Bill 115, Solis, 1999; California Government Code § 65040.12(c).

For some, the new hurdles for locating power plants ushered in a cleaner energy future. For others, however, it could be perceived differently as companies began to purchase more power from outside the state. In 2008, California imported almost 30 per cent of its power from out-of-state power plants. About 45 per cent of the total power used by the state was generated using natural gas, 18 per cent was fuelled by coal, 14 per cent from nuclear, 11 per cent from large hydropower projects and the remaining amount of about 10 per cent was generated using other renewable energy. Whether intended or not, California embodied the 'flight to natural gas' concern expressed by President Bush in 2001 when he declined to adopt greenhouse gas controls, and the state had few options for making large-scale emission reductions. In 2007, the CEC began to restrict the ability of in-state utilities to sign contracts with out-of-state coal-fired power plants. A Los Angeles Times article covering this policy stated:

California, with the strictest pollution laws in the nation, has largely phased out coal-fired generators within its borders. But the state still buys about 20% of its electricity from coal-fueled power plants in other states.

The DWP [Department of Water and Power] buys 47% of its power from two massive coal-fired plants in Utah and Arizona that are major sources of carbon dioxide and other greenhouse gases. Those contracts expire in 2017 and 2027. Now, under state law, they cannot be renewed unless those plants find a way to pump their emissions underground, but the technology to do so is unproven.¹⁵

2.2.4 Climate change

California established significant policies and programs to study and address climate change. In 1988, the CEC was designated the lead agency on climate change. It helped to oversee the state's greenhouse gas emissions inventory and facilitated the development of the California Climate Action Registry, a non-profit emissions reporting organisation. This marked the beginning of a flurry of activity on climate change in California that interacted with events occurring around the world.

In 2002, California enacted three laws and adopted the implementing regulations to achieve greenhouse gas reductions from vehicles, improving the Climate Action Registry, and adopting a renewable portfolio standard (RPS). At the regional level, California joined Arizona, Utah, Washington and Oregon to adopt a Global Warming Initiative. As reported on the CA.Gov website describing the history of climate change activity in California, these measures were in contrast with a federal call for another decade of research on climate change and voluntary measures to address climate change.

In 2003, policy activity began to 'heat up'. The CEC established the California Climate Change Research Center, which issued more than 150 research reports during its first five years. (And at the federal level, one of the first bipartisan climate change bills was introduced by Senators John McCain and Joe Lieberman.)

In 2004, California added greenhouse gas controls in the emission reduction requirements for vehicles and Governor Schwarzenegger launched the Hydrogen Highway Network. The first statewide greenhouse gas reduction targets were adopted in 2005 through an Executive Order signed by Governor Schwarzenegger. And, in 2006 the Governor signed an agreement with British Prime Minister Tony Blair for California and the UK to collaborate on climate change initiatives.

More importantly, 2006 saw the most important climate change policies being developed in the state including the following legislation:

- AB 32, the *California Global Warming Solutions Act* of 2006 established economy-wide cap on California greenhouse gas emissions at 1990 levels by no later than 2020. CARB adopted these limits that year.
- SB 1368 required the Public Utilities Commission and the CEC to implement an emissions performance standard for all retail providers of electricity in the state. The law allowed a generator to use CCS to demonstrate compliance with these standards.
- AB 1925 directed CEC to study and make recommendations on CCS technologies.
- AB 118 further required alternative fuels and vehicle technologies.

¹⁵ CA CEC, 2008 Total Electricity System Power, accessed June 2010, http://energyalmanac.ca.gov/electricity/system_power/2008_total_system_power.html

¹⁶ Los Angeles Times: "State acts to limit use of coal power, To fight global warming, municipal utilities including the DWP will no longer be able to buy electricity from plants that burn the fossil fuel," 24 May 2007, Margot Roosevelt, Times staff writer. Accessed 29 June 2010

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In 2007, a new legislative session started and in February, Assembly Member Huffman introduced AB 705. It directed the Division of Oil, Gas and Geothermal Resources (DOGGR), in consultation with the California Environmental Protection Agency (CalEPA) and the Geological Survey, to develop and adopt, by 1 January 2011, standards and regulations governing geological carbon dioxide sequestration. The timing and stewardship of AB 705 had the potential to lead to conflict. Under AB 1925, the state had just begun work on a study to assess the role of CCS in California and to develop recommendations. Further, the Global Warming Environmental Justice Advisory Committee had not formulated recommendations and did not appear to be involved in the proposed AB 705. And, finally newly elected Assembly Member Huffman had served as a senior attorney at NRDC at the time he won election. In California, bills are authored and introduced by elected Assembly Members, but it is common to refer to specific legislation as being 'sponsored' by an interested party. In the case of AB 705, it was sometimes referred to as being 'sponsored' by NRDC in hearings, informal discussion and the media.

3 Stakeholder mapping

Primary stakeholders and associated issues are grouped into three primary categories: project developers, government officials and environmental organisations. The latter are subdivided into national and state and local organisations.

3.1 Project developers

Sponsors and participants of the Carson Project were well recognised names in the global energy business. Joint sponsors were BP Alternative Energy, a global leader in decarbonised fuels projects; and Edison Mission Energy, a pioneer in Italy of first-of-a-kind integrated gasification combined cycle (IGCC) power plant and developer of independent power (coal, gas and renewable energy). Occidental Petroleum, the world's largest CO₂ EOR operator, was to be responsible for the EOR activities. Other participants included Fluor, GE Energy, URS and the West Basin Water District, a nationally known industrial water recycler.¹⁷

For these sponsors and participants, the project offered a business opportunity to take action in commercialising carbon capture and storage, seen as a critical tool in the effort to reduce the concentration of global warming gases in the atmosphere.¹⁸ The momentum that had built up in the state, culminating in a series of legislative steps favorable to the development of CCS, appeared to indicate an opportune time to introduce a first-of-a-kind commercial project that would integrate and commercialise cutting-edge technologies. The stated goal of the developers was to enable commercial deployment and establish regulatory mechanisms for CO₂ EOR and sequestration in California, and, globally, to establish the technical, environmental and commercial basis to replicate similar projects in the US and abroad.¹⁹

3.2 Government officials

Initial reactions from state and local officials were very positive. As noted previously, the project brought a strong set of tax benefits to Carson and, in addition, a \$90 million Federal Investment Tax Credit was recognised as a prestigious award. As discussed in Section 2.2.4, the legislature passed a series of bills that laid a foundation for the project and, until concern about CCS and EJ arose in the debate over AB 705, little opposition was evident. The focus on the positive aspects of the project, evident in media reports, overwhelmed signs of potential problems.

At the end of November 2006 therefore, the project team reported "strong local and state support".²⁰ By that time, the team had made contact with the key officials who would have been involved in the permitting and approval process if the project had progressed: USEPA Region IX Director staff, CEC Commissioners and siting staff, California Public Utilities Commission, West Basin Municipal Water District, California EPA, California Air Resources Board, City of Carson, Carson Redevelopment Authority, Carson Homeowners Association, Mayor of Los Angeles, State Lands Commission, City of Long Beach and Port of Long Beach.

¹⁷ Presentation by Carson Hydrogen Power at the WESTCARB Annual Meeting, Phoenix, AZ, 9 November 2006

¹⁸ Letter from Jonathon Briggs, Executive Director, Carson Hydrogen Power, to the Honorable Loni Hancock, Chair, California Natural Resources Committee, May 2007.

¹⁹ Presentation by Carson Hydrogen Power at the WESTCARB Annual Meeting, Phoenix, AZ, 9 November 2006

²⁰ Ibid.

3.2.1 State officials

Throughout 2006, the reactions of state officials to the proposed project appeared positive. CCS legislation was progressing; site permitting would involve a well established process for reconciling the state's need for electricity with local concerns; and the Governor, who had been invited to the announcement ceremony, voiced his pride in being selected to lead the nation: "I want to thank you for choosing California. This will be the first plant of its kind in the whole country and I think it is a perfect fit for our state."²¹

Numerous factors underlay the state support:

- Pride in playing a very visible leadership role nationally and internationally in following up on previous, noteworthy climate initiatives such as being the first state to adopt greenhouse gas reduction targets and signing the agreement with British Prime Minister Tony Blair in the same year as Carson was proposed
- Being a first in commercialising hydrogen power, which would provide a non-coal solution for California's energy needs, consistent with its clean energy goals
- Providing 500 MW of new generating capacity for Southern California at a time of possible future power supply shortages
- Improving air quality in the Los Angeles Basin, a major concern for the state, through the cleaner treatment of pet coke and reduced transportation emissions
- Taking a step beyond pilot plant construction in hosting a commercial enterprise that would eliminate four million tons of CO₂ per year from the atmosphere through the use of carbon dioxide sequestration
- Boosting the Southern California economy.

However, as deliberations over AB 705 occurred during 2007, some vocal stakeholders raised concerns about the timing, safety of CCS, and the potential for the Carson Project to exacerbate local EJ impacts. After three months, the sponsors tabled AB 705. This reaction to AB 705 may not have impacted the underlying business decision to cancel the proposed Carson Project, but it contributed to an overall sense that it would be more difficult to locate the project near Carson (see section 5).

3.2.2 Local officials

As noted in the list of contacts above, nearby local officials were also supportive: representatives of the cities of Carson (Mayor and Council), Los Angeles and Long Beach; the community within Los Angeles known as Wilmington and the Port of Long Beach all expressed support. Carson officials were especially enthusiastic about the project in the early stages – and this enthusiasm continued in that location, with strong disappointment voiced when the project was moved elsewhere. The primary reasons for the City's strong support were evident in the interviews:

- The tax increment from a \$1 billion investment in an area otherwise delegated to a brownfields landfill status (see Section 1.2)
- Job creation (1000 temporary and 150 permanent jobs)
- Creation of a new "wonderful" corporate citizen (BP) who could be expected to enhance the quality of the city through contributions to non-profit and charitable organisations.

The economic and other benefits were less obvious for the communities of Wilmington and west Long Beach. Both communities had residential sections in the land near the BP/Arco refinery, the likely location for the power generation and CCS plant. And, there was a lack of clarity about how they would benefit from the proposed EOR operations. Parts of the oilfields targeted for the EOR project were owned by a public entity but leased and/or operated by private companies, such as Occidental Petroleum. As the EOR plans were developed, complications over revenues from CO₂ purchase and concerns about potential subsidence issues arose locally.

²¹ BP Energy and Edison Mission Group Plan Major Hydrogen Power Project for California, News release, 10 February 2006. www.bp.com/hydrogenpower/

3.3 Environmental organizations (ENGOS)

Although it lasted only a few months, the state branches of national, state-based and local environmental organisations became very active in the debate over AB 705 and, as the debate progressed, the Carson Project became entwined in the controversy, essentially becoming, in the words of one media reporter, “a rallying point in the controversy over the bill”.

Given the progress by various states in working towards regulation of CCS, AB 705 may have seemed an innocuous bill – it called on the California DOGGR, the agency responsible for regulating oil extraction activities, to develop regulations in consultation with other agencies. The legislation to establish specific regulations covering underground storage was strongly supported by the California branch of the prominent NRDC, which was reported as being concerned about deployment of commercial sequestration in the absence of appropriate regulatory standards.²² It was also supported by the Union of Concerned Scientists, and Environmental Defense and locally by Clean Power Campaign and Environment California. However, as evidenced in the April 2007 Hearing Record,²³ AB 705 was strongly opposed by nine local and state-based environmental and EJ organisations. They raised concerns that the bill was premature because issues about the safety of CCS needed to be resolved and because the Environmental Justice Advisory Committee had not been involved in setting standards for CCS under AB 32.

3.3.1 National environmental organisations

As discussed in Appendix 1, national environmental groups played an active role in CCS although, as noted in Section 2.1.4, in 2005 they were sending mixed signals about CCS. Some large organisations, for instance NRDC, seemed to view CCS as a necessary tool for addressing climate change. Other large organisations, including Greenpeace and the Sierra Club, were more sceptical if not outright opposed to CCS, seeing it as potentially unsafe and a deterrent to moving rapidly to an economy based on renewable energy.

At the state level, NRDC did not take a position on the Carson Project. Although the presence of one of its national climate change staff at the ceremonial announcement (February 2006) along with other notables was interpreted by some as indicating support for the project, the organisation's spokespeople carefully distinguished between support for CCS technology, the need for regulation and the project *per se*. NRDC's support for CCS was based on the belief that a broad portfolio, including increased conservation and renewable energy, is needed to address the major problem of climate change. The state branch of NRDC found itself in the position of defending its position to local and state-based environmental groups in the legislative debates – first over AB 32, the *California Global Warming Solutions Act 2006*, which established an economy-wide cap on California greenhouse gas emissions at 1990 levels by no later than 2020, and subsequently in the debate on AB 705.

In a letter to the Chair of the California Natural Resources Committee, the state lead of NRDC's CCS efforts collaborated with four internationally recognised scientific experts to address the science of CCS and clarify some of the scientific issues raised by opponents during the AB 705 debate:²⁴

- CCS is needed to address climate change, viewed by an overwhelming majority of the world's scientists as “one of the most pressing and challenging environmental problems of our time”. There is no silver bullet and society will need all the tools at our disposal.
- A substantial body of evidence, knowledge and peer-reviewed literature on CCS exists. Areas where further research is needed have been identified but there is also a high consensus on the science.
- CO₂ is non-flammable and non-explosive. It is not accurate to portray it as a deadly and suffocating substance.
- CCS has been tried before. About 35 million tons annually are injected for EOR and several commercial and research projects worldwide capture and inject CO₂ in geological formations.

²² “Of Two Minds: Groups Square Off on Carbon Mitigation,” *Environmental Health Perspectives*, Volume 115, Number 11, November 2007, page 546.

²³ AB 705 Assembly Bill, *Bill Analysis*: http://info.sen.ca.gov/pub/07-08/bill/asm/ab_0701-0750/ab_705_cfa_20070420_112942_asm_comm.html. See also the fact sheet, which listed NRDC as the source for further information: *AB 705 - A Regulatory Framework for Carbon Capture and Geologic Storage*. Assemblyman James Huffman. February 2007.

²⁴ Letter to the Honorable Loni Hancock, Chair, California Assembly Natural Resources Committee, 2 July 2007, from Dr. Sally Benson, Dr. Peter Cook, Dr. Howard Hertzog, Dr Susan Hovorka, and Dr George Peridas.

- The projects give us great confidence that CO₂ can remain permanently sequestered in geological reservoirs. The IPCC report concluded that the fraction retained is very likely to exceed 99 per cent over 100 years for appropriately selected and managed geological reservoirs.
- Useful conclusions on the safe operation of CO₂ injections can be drawn from industrial analogues.
- The incidents of naturally occurring CO₂ releases at Lake Nyos and Monoun (frequently cited by opponents as evidence of potentially disastrous effects that could result from CO₂ leakage) are very different from CO₂ sequestration sites.
- The referenced research project, known as the Frio project, did not show that CO₂ will eat through the rock and escape – in fact it verified the exact opposite.

3.3.2 Local and state environmental organisations

In Carson, Wilmington, and Long Beach, the project team worked with a number of local groups to explain the project and determine how it might benefit the communities. The project team expected to continue to work to build this kind of understanding and potential support during the rigorous siting process required by the CEC. It is important to note that a large percentage of new projects in densely populated areas of California are opposed. Typically a process ensues in which project developers work with community groups to design the project in such a way to address concerns and provide local benefits. The Carson team anticipated such a process and had initiated outreach into the surrounding communities.

The debate over AB 705 added a new dynamic to this outreach process. Nine environmental groups – two local community and seven state-based groups – raised concerns about AB 705. These groups were the Coalition for a Safe Environment, a Wilmington-based non-governmental organisation; California Communities against Toxics; California Safe Schools; California Environmental Rights Alliance; CLEAN; Del Amo Action; Greenaction; Desert Citizens Against Pollution; and, Society for Positive Action.

Initially, concerns focused on air emissions from the power plant; subsequently, the focus became opposition to sequestration. In mid- to late- 2006, the leader of the community-based Coalition for a Safe Environment, who subsequently took a leading role in opposing the project, raised concerns about the air quality impacts of the energy generation plans. The proposed project site in the South Bay was located in an area where oil refining played an important role in the economy but where “local politicians and activists have long denounced the refineries for the amount of air pollution they generate”.²⁵ A lawsuit filed by a coalition of community groups and environmentalists, including the NRDC, arose in relation to construction of new power plants in Southern California. The suit alleged that the South Coast Air Quality Management District, which oversees air quality in a four-county region, violated state laws when it approved rules the previous month that would allow new power plants to use emission credits from a pool that was formerly reserved for existing facilities such as hospitals and fire stations. Although the Carson Project had not filed a permit application or indicated that it might need to use credits from this pool, the media reported it as another example of the problem in the context of the lawsuit. The concern was that all of the new power plants would be built in or near a Hispanic or low-income community where there were already significant air pollution problems, and that the new plants would not be replacing any existing power plants.²⁶

Opposition became more vocal the following spring, when, in the legislature, discussion of the Carson Project became entwined in the short-lived but contentious debate over AB 705. All of this occurred before the project development team had filed a permit application – while still in the project design and site characterisation phase. As a result, as noted by one interviewee, AB 705 became the forum for debate over the Carson Project by default.

In this debate, the nine local and state-based environmental justice groups opposed CCS and the proposed lead role designation of the DOGGR (albeit in consultation with other agencies) in guarding environmental health. In their view, DOGGR's lead role came across as an effort to bypass the authority of the Global Warming Environmental Justice Advisory Committee established under AB 32. The groups' opposition to CCS technology was linked to its role in the broader energy debate over energy sources (and their support for 'green' power and opposition to the use of coal in particular), as well as to their concerns about environmental justice. This link is epitomised

²⁵ The narrative descriptions in this section of Carson, Long Beach and the South Bay area are based on information in Wikipedia, http://en.wikipedia.org/wiki/South_Bay_Los-Angeles

²⁶ “Suit Filed Over Power Plants. Groups Seek to Block Construction on Pollution Concerns,” Kristopher Hanson, *Press Telegram*, 24 October 2006.

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in the heading of a letter submitted in April 2007 by the Executive Director of California Communities against Toxics to the Chair of the Natural Resources Committee, which was subsequently posted on the internet: *Carbon sequestration: injection of toxic gases into poor communities or the salvation of the fossil fuel industry, or both?*²⁷

The author, who reportedly "helped galvanise activist opposition to AB 705",²⁸ emphasised that "recent studies conclude that carbon sequestration could create alarming environmental problems, endanger communities and potentially be very costly to both ratepayers and taxpayers". Specifically:

- CO₂ is a health hazard if it were to escape from sequestration, as illustrated by two events. A volcanic crater lake, Lake Nyos, "belched bubbles of CO₂ into the still night air" where it settled around the lake's shore and killed 1,800 people and "countless thousands" of animals. A 1984 gas release at Lake Monoun which killed 37 people "devastated a local village and killed animals for miles".
- Sequestration would be used to extract more carbon from the ground to be burned in gasoline that would emit more CO₂ into the air
- California oilfields are located in predominantly poor rural communities. The science and policy issues surrounding the burial of "extremely toxic gases" in environmental justice communities deserve a special select committee of the legislature to examine and report back to the policy committees
- There are huge costs involved in sequestration. The fossil fuel industry has shown no sign that it is willing to bear the liability of CO₂ leaks from underground storage. Presumably the cost, which would be akin to a huge natural disaster for a community should a leak occur, would be borne by taxpayers.

The EJ spokesperson who had earlier been quoted in an article over the air quality suit discussed above, the Executive Director of the Wilmington coalition became the most vocal opponent of the Carson Project. In a letter to the legislative committee, he expressed a number of concerns, which by that time had expanded beyond the environmental justice concerns over air quality raised in the lawsuit to include a list of 11 definitive statements about the "public health and environmental dangers of hydrogen production and carbon sequestration", and 14 "other significant facts" (The first 11 statements in the letter are quoted verbatim.):²⁹

1. Will create millions of tons of new CO₂ green house gases each year, increasing global warming
2. Will create tons of new toxic SOX and NOX air pollution each year
3. Will create hundreds of pounds of new toxic mercury and heavy metals air pollution each year
4. Will create tons of new toxic mercury and heavy metals in residual slag left over from refining coke each year
5. Will create hundreds of tons of residual slag left over from refining petro coke each year which will be transported to public land fills
6. Will require the transformation of CO₂ gas to CO₂ liquid which is acidic
7. CO₂'s acidic nature is corrosive to the underground environment, contaminating the ground and would eventually leach to the surface
8. When CO₂ escapes from underground to the surface it also changes from liquid to gas, it is 1.5 times heavier than air, does not readily disperse in the atmosphere, stays close to the ground and will kill every living human, animal and plant within 20 miles from asphyxiation
9. When CO₂ leaches up to the surface, it will contaminate underground fresh drinking water aquifers, lakes, rivers and the ocean

²⁷ *Carbon Sequestration: Injection of Toxic Gases into Poor Communities or the Salvation of the Fossil Fuel Industry, or Both?* Jane Williams, April 2007. See http://californiaproggressreport.com/2007/04/carbon_sequestr.html

²⁸ "Of Two Minds: Groups Square Off on Carbon Mitigation," *Environmental Health Perspectives*, Volume 115, Number 11, November 2007, page 548.

²⁹ Hydrogen-petroleum Coke Power Plant Proposal, AB 705 CO₂ Geologic Sequestration.

10. Excessive amounts of CO₂ in the ocean causes acidification which destroys coral reefs, coralline algae, benthic organisms, foraminifera, pteropods, marine calcifiers (shellfish) and plankton
11. Southern California is an earthquake country with numerous faults. No company can guarantee the CO₂ will never escape and BP/ARCO & Occidental Petroleum will not provide billion dollar liability insurance coverage. The public will be stuck with the cost of lives, public health care, environmental restoration and disaster recovery.

4 Communications – public engagement

4.1 Communication/public engagement approach

The project team reported that its strategy was to stay out of the media early – until all the key stakeholders were fully briefed and had a better understanding of potential concerns and perceived benefits. Their outreach activities spanned about two years, beginning with a number of key contacts at the state and local level before the announcement in February 2006, to which more than 190 invitations were extended. Pre-announcement contacts were primarily with state and local officials as well as local groups that represented the community, including some of the populations traditionally the subject of environmental justice concerns. The team did not brief some of the state's leading environmental justice group spokespeople before the event.

The news release and announcement ceremony was the first, and very public, disclosure of the project. It immediately received media coverage and considerable fanfare as a result of the presence and statements from high-profile participants, including Governor Schwarzenegger. Outreach was later stepped up as the technical analysis proceeded and expanded to include a wide range of community leaders and groups.

By the end of 2006, the project team had made contact with the key federal, state and local officials who would play a role in moving the project forward.³⁰ The project team reported that “on the ground” outreach was undertaken during the last few months of 2006 and the beginning first two quarters of 2007, and the number of contacts expanded to several hundred. Outreach extended beyond Carson to include the surrounding communities of Wilmington and Long Beach, which were as close to the proposed plant and as likely to be impacted as Carson residents – yet would not receive the local tax benefit. Outreach included community leaders, environmental organisations, community Hispanic and Filipino organisations, churches and sports organisations. Outreach was also expanded to include a Hispanic team as well as a local community outreach team to incorporate the communities they were seeking to reach. They also cooperated with authors of a story book for children. A long meeting with a vocal EJ spokesperson was held in April 2007, as the debate over AB 705 was proceeding.

Other interviewees' comments generally corroborated the extent of outreach efforts outlined by the project team. Concern was expressed, however, that the team had “not done itself any good” by making a “grand announcement” before knowing where the CO₂ would be stored and before evaluating the extent of potential opposition to any new, air-polluting facility by selecting a site which was “notorious” for the presence of environmental justice activism. There was also a related concern that there had been a flavour of “Decide-Announce-Defend” in the early days of the project. To quote one interviewee:

So, I think they did their outreach, but it was already too late ... I mean the business people got together and said: “That will be a great location from a business point of view” and there was no consideration of the local dimensions, the local environmental and social dimensions ...

As you know, it was an afterthought and they decided on a location, they said: “OK, what can we do now to deal with the local reaction?” You know it was very much not a case of: “Do we think this is a good location in the first place and should we be considering alternatives because public outreach is an integral component to how we assign projects?”

In addition, one interviewee noted that the team had been unprepared to answer questions that could have been predicted to occur about the potential issues posed by orphan wells and/or increased emissions. And finally, one interviewee noted that pre-occupation with engaging high-profile support (State Governor, Tony Blair) had sometimes taken priority over maintaining close relationships with local officials.

³⁰ Presentation by Carson Hydrogen Power at the WESTCARB Annual Meeting, Phoenix, AZ, 9 November 2006

4.2 Corrective measures

Outreach activities centered on the Carson site tailed off during 2007. In interviews, company spokespeople stated that, in view of the uncertainty about the storage location, they made a conscious decision in mid-2007 to 'stand down' on the Carson Project until the fundamental technical and financial issues related to the storage site were resolved. They also emphasised that the timing of this with the AB 705 defeat was coincidental.

4.3 Media involvement

Apart from the announcement, the Carson Project received limited media coverage from the time of its public announcement until the local coverage of its abandonment three years later.

4.3.1 Project announcement and initial media reaction

Initial media coverage focused on the project announcement in February 2006. The announcement was made in a joint press release by BP and Edison Mission Group at a high-profile, public meeting. As noted by a staff writer from the *Los Angeles Times*, the project was "sufficiently important to warrant the attendance of John Bryson, Edison's Chairman and chief executive, and BP America CEO Ross Pillari, along with Gov. Arnold Schwarzenegger."³¹

Two aspects of the release are noteworthy. First was the emphasis on benefits that would accrue to the state compared with the local area surrounding the power plant. Second, was the focus on the technical advantages of a clean, first-of-a-kind power plant near BP's Carson refinery and fuel supply, with only a very general reference to the storage location.

The two-and-a-half-page media release cited a number of benefits that the project would bring to the state and its economy, including "providing 500 MW of clean generating capacity for Southern California at a time when state agencies are predicting possible power supply shortages during the coming years", as well as "eliminating four million tons of CO₂ per year from the atmosphere by sequestering [sic] underground". No mention was made of potential benefits – or potential disadvantages – from the more local perspective of those living nearby. The release acknowledged that final project decisions required more study, in addition to review by the California Energy Commission and the South Coast Air Quality Management District, discussions with stakeholders and electricity generating revenues. However, the specific location of the storage area was not identified and no details were provided about associated regulatory and stakeholder activities. The topic was reported as "BP is in discussions with Occidental Petroleum to develop options for sequestering the CO₂ in Occidental's California oilfields".³²

Governor Schwarzenegger's strong endorsement at the ceremony demonstrates the focus and tone of the announcement:

I want to thank you for choosing California. This will be the first plant of its kind in the whole country and I think it is a perfect fit for our State. With our Strategic Growth Plan, a commitment to Air Quality and innovative projects like this Hydrogen Plant, I know we can have clear skies, improve our quality of life and build a stronger, more vibrant economy for California.

4.3.2 Reported key stakeholders and issues

The first indication of concern in media coverage that followed the project announcement was a report in autumn that year on a lawsuit against the South Coast Air Quality Management District, in relation to construction of new power plants in Southern California, including the Carson Project.³³ It was not until the following spring that media coverage became more intense in the coverage of legislative activity around AB 705.

Development of the Carson Project and discussion of AB 705, which was intended to provide the regulatory framework for sequestration, overlapped both in time and in the presentation provided by the media reports reviewed by the research team. Frequently, reporting on the two events was intermingled. For the most part, the

³¹ "Edison, BP to Unveil Carson Power Project," *Los Angeles Times*, 10 February 2006

³² *BP Energy and Edison Mission Group Plan Major Hydrogen Power Project for California*, Press release, 10 February 2006. www.bp.com/hydrogenpower/.

³³ "Suit Filed Over Power Plants. Groups Seek to Block Construction on Pollution Concerns," Kristopher Hanson, *Press Telegram*, 24 October 2006.

media focused on statements from key stakeholders in the environmental community and the split between national and local groups on the carbon dioxide sequestration issues. In one instance, the extent of local opposition was grossly exaggerated to 70 activist groups (compared with the nine groups listed in the legislative record).³⁴

The media presented the NRDC's viewpoint that, while agreeing with opponents that "conservation and renewables should play a much larger part than CCS in mitigating global warming", CCS technology "is a necessary fallback technology because of the urgency dictated by the climate problem".³⁵ NRDC is also reported as commenting that: "The environmental justice people had a hard time separating CCS technology from their specific project."³⁶ However, this position was modified in a subsequent statement that: "Even though I sympathise with their concerns about siting of the plant, I think the arguments they put forward regarding the mechanics of sequestration itself were not valid." The media reported that opposition arose from the Coalition for a Safe Environment and California Communities Against Toxics. The project opponent most frequently quoted in the media was the Coalition's Executive Director, who claimed credit for killing the project. The reasons cited in the media for his opposition were similar to those cited very definitively in his letter to the legislative committee:^{37 38}

- CCS will further dependence on fossil fuels and hinder development of a sustainable society with renewable energy sources
- Oil sequestered in the Wilmington oilfields could escape through old, 'orphaned' oil wells
- Burning pet coke releases 'vast' amounts of pollutants into the air
- Creation of hydrogen poses a 'huge' fire hazard, which is made even more hazardous by location in the vicinity of an oil refinery in a heavily populated area
- Exposure to high concentration of CO₂ is fatal – and there are many examples of people and animals being killed in this way
- The stored CO₂ will be in a liquid form, called carbonic acid. It will eat through the limestone that encases the proposed oilfield and/or the cement that plugs nearby plugged wells, allowing it to escape
- If large quantities of CO₂ were to leak, it would remain concentrated in the already polluted Los Angeles Valley and constitute a public health disaster.

Rebuttal of some of these issues by the NRDC and project spokespersons was primarily cited in the legislative debate over AB 705, where discussion occurred for the most part.

No formal announcement was made of the decision to terminate the project, and the decision was not reported in the local media until May 2009. At that time, company spokespeople emphasised that the reason for moving to an alternative location was a purely business decision. Occidental Petroleum, which had planned to buy the gas for its drilling operations in the Wilmington Field, had determined that the geology was not suitable and had therefore decided not to buy it.³⁹

5 Analysis of communication and public engagement approach

It is tempting to judge this project as a failure because the decision was made to end efforts to develop the carbon capture facility in Carson and the storage facility in Long Beach. If this is the case, then the obvious course is to look at what the project developers could have done to achieve a different project outcome. After interviewing key stakeholders,⁴⁰ learning more about the physical conditions in the proposed project area, and considering the intense political backdrop, the authors tend to agree with a conclusion offered by one of the stakeholders: the right outcome was achieved, although maybe not for the best reasons. Implicit in this view is the idea that, while the

³⁴ "Promoters of CO₂ Storage Prepare to Meet a Wary Public," Darren Samuelsohn, Greenwire, 17 October 2007.

³⁵ "Of Two Minds: Groups Square Off on Carbon Mitigation," Environmental Health Perspectives, Volume 115, Number 11, November 2007, page 548.

³⁶ Ibid, p, 549

³⁷ Ibid, p, 549

³⁸ "Public Safety Victory in California over Pet-coke Plant Dispute," TEXAS VOX, posted by Public Citizen Texas, 19 May 2009.

³⁹ "Plans for Carson 'Green' Power Plant are Dropped" *Daily Breeze*, 17 May 2009.

⁴⁰ See methodology discussion in Section 1.

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project team may have done some things well and others not so well, additional factors outside its control had an enormous role in the project outcome. The Carson Project demonstrates very clearly the complex nature of CCS siting and its integral link to the political and social context, including broader energy policy issues and associated controversies.

5.1 Factors affecting the outcome of the project

Although the researchers' focus was initially on evaluating the communication aspects of the case study, closer examination revealed that much more than effective communication is involved in a successful project outcome – where success is defined as achieving the initial mission of siting a power plant and sequestering carbon dioxide. The situation in Carson was additionally complicated by the challenge of being a first mover. Thus, while gaining from the momentum that had built up for “clean, green energy”, the project also encountered many associated challenges. This section attempts to pinpoint some of these factors.

1. The project team conducted extensive communication and outreach using a tiered approach.

Initially the team contacted decision makers and opinion leaders at the state and community level. They organised a project announcement event to which almost 200 people were invited. Within the ensuing year, they brought on communication personnel who had experience with various stakeholder groups, including Latin Americans and environmentalists, and initiated a series of several hundred one-on-one and small group discussions and presentations. However, after the announcement, communication efforts became overwhelmed by concerns about air quality and environmental justice in the power plant location, and, in turn, these rolled into concerns about the role of CCS in the broader energy arena, particularly in the debate over AB 705.

As a critique, public outreach could have been more integrated into initial project planning and management. Clearly the project team anticipated some of the concerns that arose in relation to the project. However, the project carried so many benefits that perhaps this clouded the evaluation of the locally driven concern over air pollution and the potential difficulty of locating a facility in an area well known for its air quality and environmental justice issues. This oversight was compounded by the delay in contacting and potentially gaining support from especially vocal environmental justice spokespeople and the absence of this important community voice at the celebratory announcement. As concern about air pollution rose, it became possible for activists to raise unanswered questions about the site of the plant and the storage, contributing to a withering of active support.

2. Concerns about air quality and environmental justice dominated environmental considerations in the greater Los Angeles area and appear to have initially trumped concern about climate change, the safety of CCS and the economy.

The project development team proposed a project that addressed several important environmental concerns. It used a locally generated by-product, reduced truck traffic, potentially assisted in avoiding subsidence in Long Beach, and avoided contributive emissions in Asia that had an impact on Californian air quality. In addition, it would have demonstrated that large scale CCS could be achieved on a commercial basis, countering some industry claims. Economically, the project drew federal support (tax and USDOE incentives), retained economic and employment benefits locally, and would have contributed a revenue stream in a depressed area. And the project would provide carbon-reduced energy within California.

But the proposal to locate in an area with pre-existing severe air quality problems and a history of environmental justice actions to address those conditions meant that any increase in criteria pollutants locally, even if somewhat countered by local and global benefits, was going to be a major concern. Indeed, the earliest media coverage of concern about the project focused on a lawsuit involving criteria/conventional air pollutant increases on local populations from the capture plant, not about the integrity of the storage facility or the benefits of the project.

3. The high visibility focus on a first-of-a-kind power plant dominated the message and thinking, perhaps making it more difficult to recognise how strong opposition to criteria pollutants would become.

As a first mover, the project benefited from the momentum that had been building for CCS. This worldwide momentum was especially notable in California, which had taken many of the needed 'first mover' steps to bring ideals to reality. There was thus strong interest from state leaders and incentives to developers and host communities from emerging financial incentive programs. However, it is telling that the news release for the public announcement of the project highlighted the power plant and carbon capture and downplayed the storage component. This release indicated that the team was in discussion over a storage location in Long Beach, not that the plan had been finalised to firmly include that location as part of the project. As the project progressed, the storage aspects were increasingly questioned. Significantly, while media attention highlighted opposition from environmental justice activists, problems that emerged with the technical and commercial viability of the storage ultimately led to selection of an alternative site.

Initially, stakeholder perceptions of the project seemed to focus more on criteria pollutants than climate change or sequestration, although as discussions over the storage component proceeded, concern over the criteria pollutants became vocal. As a result, when questions about leakage, the safety of storage, and the potential impact on subsidence were finally raised at a much later stage during the AB 705 debate, those who were already opposed on the grounds of pollution, environmental justice and linkage of CCS to continuation of fossil fuels were more inclined to be suspicious. The suspicion was strengthened by the lack of a specific site that had been adequately characterised to point to, and there was no strong partner in charge of storage to stand up and answer the concerns.

Also emerging as the technical studies began were issues about commercial and technical feasibility of storage in the Wilmington oilfield. It was these issues that the project team reported as ultimately leading to the search for an alternative location.

4. Efforts by others to clarify what regulatory framework would or should apply added an unwelcome complication. These efforts coincided with, but were unrelated to, the development of the Carson Project.

In theory, the Clean Air Act and Safe Drinking Water Act provided most of the regulatory framework to permit a power plant and an injection project. However, neither of these addressed climate change. Further, the USEPA had indicated that it thought additional requirements might be needed to regulate sequestration but had not yet proposed the rules for sequestration wells (later proposed as UIC Class VI rules). California had authority to implement the permitting program for injection related to enhanced oil recovery, but not necessarily for storage. As a result, there was not a clear cut set of regulatory safeguards and requirements for the project or a well defined process for progressing the project.

In theory also, California AB 705, the bill requiring DOGGR to develop regulations for carbon dioxide storage in consultation with other agencies, should have reduced this regulatory uncertainty. It did not. Coming on the heels of several bills that supported CCS as a climate option, the introduction of AB 705 was seen by environmental justice activists as an effort to prevent them from having a forum for consultation. Although the Carson team was not involved in the legislation, the Carson project became a symbol in what turned into a heated debate about the future of energy projects in California.

5. Connections to the national and international debate on climate brought favorable and negative attention to the Carson Project.

In particular, growing partisan politics over climate change led key interest groups to act somewhat opportunistically, pointing to technology projects as both distractions and potential solutions. This created a confusing backdrop for local stakeholders' consideration of CCS.

Ultimately, the decision to drop the Carson Project was influenced by a set of business considerations. Complications over the ownership structure of the intended storage location made it difficult to work through commercial terms for the purchase and injection of the carbon dioxide. At the same time, it became a visible symbol of a long-standing debate about the role of fossil fuels in the energy future of California. The Carson Project represents a significant attempt to move into uncharted commercial territory at a pivotal time in the development of CCS; the lessons may benefit future projects.

Appendix 1 – Additional information about the national context

A.1 National context of CCS

A.1.1 Political activity

In the United States, political activity addressing climate change continued to rise over the last half decade, although the American Institute of Physics credits US statesman Benjamin Franklin with one of the earliest recorded papers to raise concerns about climate change in 1784.⁴¹ Flash forward to 1977: Representative George Brown of California introduced HR 6669, the National Climate Act, which established a “National Climate Program to enable the United States and other nations to understand and respond to natural and man-induced climate processes and their implications.”⁴² This was followed in 1980 by a report entitled “The Global 2000 Report to the President of the United States” that was developed by the US Council on Environmental Quality and summarized current knowledge on climate change.⁴³ In 1988 the United Nations created the Intergovernmental Panel on Climate Change (IPCC) to develop a comprehensive review of the science and implications of climate change; the IPCC delivered its first report in 1990 highlighting the global importance of addressing climate change.⁴⁴

The first major activity by the United States might be seen as its support of UN’s Framework Convention on Climate Change (UNFCCC) under the first Bush Administration. This support ultimately led to the negotiation of the Kyoto Protocol under the Clinton Administration in 1997. However, the country by no means united in efforts to address climate change. During the Kyoto negotiations, the Byrd-Hagel resolution was adopted by the US Senate, expressing the “Sense of the Senate” that the country should not ratify the Kyoto Protocol if developing nations did not also agree to targets or if achieving greenhouse reduction targets would harm the US economy.⁴⁵ The Byrd-Hagel resolution passed several years after Newt Gingrich and the “Contract with America” ushered in a major shift in the US congress. Democrats lost their majorities and more conservative Republican majority did not support adoption of climate policies that were perceived to be unwarranted and too expensive.

The presidential election of 2000 was hard fought, and the legitimacy of the outcome was challenged by many, primarily splitting along the lines of strong conservatives who supported the Supreme Court decision and strong liberals who did not. In regards to climate change and the role of CCS, battle lines continued to be drawn when shortly after being elected, President Bush withdrew his campaign pledge to support of clean coal technology research and the development of requirements to reduce, among other emissions, carbon dioxide. In March 2001, President Bush wrote a letter to Senator Hagel that, according to CNN, President Bush “noted that carbon dioxide was not considered a pollutant under the Clean Air Act and said a recent Department of Energy review had determined ‘that including caps on carbon dioxide emissions as part of a multiple emissions strategy would lead to an even more dramatic shift from coal to natural gas for electric power generation and significantly higher electricity prices compared to scenarios in which only sulfur dioxide and nitrogen oxides were reduced:... The environmental group, Sierra Club, was outraged.”⁴⁶

The Pew Center on Climate Change, founded in 1998, is a bi-partisan organization focused on the issue reports that the “number of climate change-related legislative proposals increased from seven introduced in the 105th Congress (1997-1998) to 25 in the 106th Congress (1999-2000), to over 80 in the 107th Congress (2001-2002) to 96 in the 108th Congress (2003-2004). One hundred and six legislative proposals were introduced in the 109th

⁴¹ American Institute of Physics, The Discovery of Global Warming – bibliography by Year, accessed online July 3, 2010 at: <http://www.aip.org/history/climate/bibdate.htm>

⁴² Thomas, The Library of Congress, HR 6669 – CRS Summary, accessed online July 3, 2010 at: <http://thomas.loc.gov/cgi-bin/bdquery/z?d095:HR06669:@@D&summ2=m&|TOM:/bss/d095query.html>

⁴³ Council on Environmental Quality, “The Global 2000 Report to the President of the U.S.” Washington, DC., U.S. Govt. Printing Office, 1980.

⁴⁴ IPCC, History, accessed online July 3, 2010 at: http://www.ipcc.ch/organization/organization_history.htm

⁴⁵ Thomas, Library of Congress, S.Res. 98, Text, accessed online July 3, 2010 at: <http://thomas.loc.gov/cgi-bin/query/z?c105:S.RES.98>:

⁴⁶ CNN, Bush Reverses Position on Emissions Reductions, March 31, 2001, accessed online July 3, 2010 at: <http://archives.cnn.com/2001/ALLPOLITICS/03/13/power.plant.emissions/index.html>

Congress (2005-2006)."⁴⁷ Although several of these proposals included firm targets for greenhouse gas reductions, to date none of those bills has garnered enough votes to pass. Instead, the US congressional activity is characterized by a number of bills promoting clean technologies and further study of climate change. Many of these proposals included provisions for funding the research, development, and deployment of carbon capture and carbon dioxide sequestration. This has fueled debate that persists today about whether CCS is a real option for addressing climate change or a boondoggle.

A.1.2 Regulatory developments

CCS is comprised of three main suites of technologies, each of which is federally regulated under separate programs. The carbon dioxide capture portion is typically associated with air emissions, and although CO₂ is not yet a regulated gas, many have assumed that the model for regulating carbon capture can be found under air pollution control programs administered by the USEPA or delegated to States. Pipeline transportation is typically the purview of the Office of Pipeline Safety within the US Department of Transportation. And injection operations are regulated through the Safe Drinking Water Act's Underground Injection Control (UIC) program that is administered by USEPA or delegated to states.

Within the UIC program there are currently five classes of wells.⁴⁸ Class I wells are for the disposal of hazardous wastes, industrial non-hazardous liquids, or municipal wastewater. Class II wells are used for the production of hydrocarbons, the disposal of fluids related to hydrocarbon production, or the underground storage of hydrocarbons. Class II and IV wells do not pertain to CCS. Class V wells include all other wells not covered by Classes I-IV. Typically Class V wells are shallow or involve an experimental technology. Typically, Class I and Class V wells are administered by USEPA or a state environmental protection agency. Typically Class II wells are administered by the natural resources agency within a state. Oil and gas fields are regulated with a strong eye towards conserving or optimizing the natural resource, so while injection operations must not contaminate drinking water supplies, they face somewhat less stringent requirements than Class I injection wells.

As CCS gained prominence as a potential option for addressing climate change, the issue of regulatory oversight of carbon dioxide storage also gained prominence. At the heart of the discussion was a concern over who would regulate carbon dioxide storage, how stringent the regulations would be, and whether efforts to regulate CO₂ injection for sequestration would interfere with enhanced oil recovery operations using CO₂ that are currently permitted under Class II.

At the time of the Carson Project was announced, the regulatory path for carbon dioxide storage was not certain. USEPA had convened an internal workgroup in 2005 to review CCS. In 2005 this group sponsored two technical workshops on the CCS issues.⁴⁹ Later, in 2006, the Director of the Office of Ground Water and Drinking Water issued a letter to State and Regional UIC contacts indicating that USEPA was reviewing the issue of CCS and recognizing that the Regional Carbon Sequestration Partnerships (RCSP), a research program administered by the USDOE would likely be seeking permits for a series of pilot injection projects. In this communication, USEPA indicated support for the use of Class V Experimental permits for these pilot projects. USEPA continued to sponsor technical workshops on specific CCS issues. In 2007, USEPA clarified its position on CO₂ injection by issuing USEPA Joint Guidance UICPG#83 on using Class V Experimental Technology classification for permitting pilot projects. Interestingly, UICPG#83 was jointly issued by the Office of Ground Water and Drinking Water and the Office of Atmospheric Programs.

Stakeholders raised several concerns about the existing UIC regulations. The UIC program was designed to protect drinking water supplies, not to address climate change; therefore one concern was that program would not have authority to address potential CO₂ leaks that did not threaten drinking water supplies but nonetheless had potential to impact the atmosphere. Further, current injection efforts were either much smaller in scale than was envisioned for CCS or related to production operations in which reservoir pressures would be maintained not increased. This led to questions about whether the existing program was sufficient to adequately ensure that CCS would be safe.

⁴⁷ Pew Center on Climate Change, Legislation in the 109th Congress Related to Climate Change, accessed online July 3, 2010 at: <http://www.pewclimate.org/federal/congress/109>.

⁴⁸ See US EPA UIC Program: Classes of Wells - <http://www.epa.gov/safewater/uic/wells.html>.

⁴⁹ US EPA, UIC Program, Geologic Sequestration of Carbon Dioxide, accessed online July 3, 2010 at: http://www.epa.gov/safewater/uic/wells_sequestration.html.

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Other concerns were also raised. During this period USEPA continued to host technical workshops in which it sought information from experts regarding carbon dioxide storage. This work culminated in USEPA publishing, in July 2008 proposed rules under the UIC program creating a new Class VI well for geologic storage of carbon dioxide. Since that time USEPA has published a Notice of Data Availability (NODA) for the proposed Class VI rules and they have conducted hearings, technical workshops and webinars. It is expected that USEPA will finalize the rule by 2011.

During the active period for the Carson Project, it was not clear if, how or when USEPA would establish a regulatory framework specifically for carbon dioxide storage. Lack of regulatory certainty was often cited as hurdle to the deployment of CCS projects even though the Carson Project was attempting to move ahead within the existing regulatory framework.

A.1.3 Regulatory developments – other states

Efforts to develop climate policy and to address CCS were active at the state level during this timeframe. No state was more active than California and efforts within the state will be discussed in section 2.2.

State Climate Change Activities

In 2003 the Governors of ten Northeast States announced an initiative to develop a regional carbon dioxide control program. This effort led to the development of the Regional Greenhouse Gas Initiative (RGGI) that became effective in 2009. At the same time, more than 20 states including New Mexico, Maryland, Pennsylvania, Rhode Island, Texas, Illinois, New York, Vermont, Washington, Montana, Iowa, New Jersey, Arizona, Wisconsin, Colorado, Michigan, Oregon, Minnesota and Hawaii adopted policies that required or strongly encouraged the development of renewable energy and energy efficiency programs (e.g., renewable portfolio standard (RPS), alternative energy portfolio standards). And, about 20 states, including the 10 Northeast States of RGGI, New Mexico, Arizona, Alaska, Illinois, Hawaii, Oregon, Utah, (and California) adopted programs that directly addressed climate change through reduction requirements or incentives. In addition, Washington implemented its rule requiring all new power plants to meet a carbon dioxide emission performance standard and allowing them to meet this standard using CCS. Importantly, during this timeframe New Jersey passed a law classifying CO₂ as a contaminant and several states rejected bids to develop new power plants (e.g., Kansas) that did not address climate change.

State CCS Activities

The states were also very active with regard to CCS. Some states were more focused on the environmental protection aspects of CCS and others expanded their focus to include a variety of issues that arose out of the world of commercial development of natural resources. By 2006 there was a growing discussion about several issues, including:

- **Property rights:** who owned the rights to the pore space in the subsurface and what happened if the mineral right rights were actively being used for mining, hydrocarbon production, natural gas storage or some other activity? In addition, questions arose about what was the relevant pore space, was it the extent of the modeled CO₂ plume, the area of elevate pressure in the subsurface or something else? Could efforts used to unitize oil fields where there were multiple owners be used in carbon dioxide storage?
- **Liability:** it was not clear if CO₂ would be deemed a commodity (it was being purchased for EOR) or a waste, and if a waste could it trigger RCRA liability? Also, the purpose of carbon dioxide storage is permanent isolation from the atmosphere. This timeframe begged the question of who would take responsibility over time if injected CO₂ leaked.
- **Regulatory authority:** There was a serious question about whether USEPA should regulate CO₂ injection or if it should fall to another agency. The Interstate Oil and Gas Compact Commission (IOGCC), established in 1935, is a 30-state government agency focused on the conservation of the nation's oil and natural gas resources while working to protect public health, safety and the environment. Recognizing the potential overlap between regulation of carbon dioxide for purposes of EOR and sequestration, the IOGCC initiated

⁵⁰IOGCC, Resolution 02.122, 2002

a taskforce in 2002 to "take a lead role in the coordination of an effort to develop regulatory guidelines and/or guidance documents on carbon dioxide capture and storage."⁵⁰ The IOGCC taskforce coordinated with the natural resource and groundwater protection regulators in its member states, geologists, USDOE and USEPA to develop a model statute and guidance document for carbon dioxide storage⁵¹ which found:

A key conclusion of that report was no other jurisdiction has the experience and expertise of the states and provinces in the regulation of oil and natural gas production and natural gas storage – factors critical to the effective regulation of the geologic storage of carbon dioxide.

Although the Task Force recognized in Phase I that states and provinces might have statutory and regulatory frameworks that could accommodate CO₂ injection and storage, they also recognized that some modification of those frameworks would likely be necessary, particularly for the post-operational phase for which no regulations existed.

A.1.4 Environmental groups (ENGOS)

The past decade has shown that the environmental community is not homogenous in its views on CCS– particularly at the national level. Further, even within specific environmental groups there may be subgroups with differing views on a topic. So, for example, within a single ENGO, those members focused on climate change might be cautiously supportive of CCS because of its promise to deliver large reductions, whereas others who are focused on environmental justice or biodiversity might be somewhat opposed because of the criteria pollutants and the impacts to habitat from mining coal. This potential for differing views was exacerbated by different views on how to best secure meaningful climate change policy, with some viewing CCS as a means to achieve climate change goals and others viewing it as undermining such goals by competing with cleaner energy sources. Some of these differences in perspectives were played out in the Carson arena.

Environmental groups can play a key role in the public perception of CCS. In 2005, the environmental community was sending mixed signals about CCS⁵² as demonstrated in the following quotations:

From an NRDC presentation:

"CCS: Deployment Must Begin Now

- *Further delay will increase climate protection costs.*
- *Further delay will not reduce technology costs.*
- *Impacts of CCS on electricity prices are modest."*

From a Greenpeace Blog:

"Take "carbon capture and storage" for instance; the 'suck it out of the sky and stick it under a rock' approach. This process promises to trap CO₂ from the burning of fossil fuels and store it in the sea or under the Earth's surface. Even if it delivers it won't be ready for at least 15-20 years, it will increase the cost of power generation, reduce the efficiency of power plants and require long-term monitoring to make sure the CO₂ stays put. Whilst money is diverted into these future technologies in a bid to continue business as usual, proven renewable and energy efficiency technologies that are ready to use now lack investment from both governments and industry."⁵⁴

⁵¹ IOGCC, CO₂ Storage: A Legal and Regulatory Guide for States, (2008) available online at: <http://iogcc.myshopify.com/collections/frontpage/products/co2-storage-a-legal-and-regulatory-guide-for-states-2008>

⁵² Stephens, J., Growing Interest in Carbon Capture and Storage (CCS) for Climate Change Mitigation, Sustainability: Science, Practice, and Policy, Fall 2006, Volume 2, Issue 2, <http://ejournal.nbii.org/archives/vol2iss2/0604-016.stephens.html>

⁵³ Hawkins, D., "CO₂ Capture & Storage – Just Do It!" presentation to USEA, August 2005, accessed July 3, 2010 at: <http://www.usea.org/Programs/CFFS/CFFSErice/Presentations-Remarks/Hawkins%201100.pdf>

⁵⁴ GreenPeace Blog, August 2005 accessed July 3, 2010 at: <http://www.greenpeace.org/international/en/news/features/USAsiaPacClimatePact111/>

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Attributed to Sierra Club in an NPR story:

"Environmental groups are opposed to this research. Dan Becker with the Sierra Club thinks government should focus instead on reducing CO₂ emissions but, he says, the Bush Administration appears more interested in finding solutions that allow the fossil industry to continue polluting."⁵⁵

A.1.5 Industry response

Industry response also was not uniform. There is anecdotal evidence that companies involved in EOR were expressing confidence in discussions in the halls of Congress and at the state level that CO₂ injection could be done safely and cost effectively. Likewise, the electric utility industry, representing the companies likely to have to implement CCS, expressed concern about the reliability and cost of CCS. While it may not be obvious, these perceptions are not mutually exclusive; rather, they reflect a conflation of the component technologies involved in CCS. There was a lot known about injecting CO₂ for EOR and a 35+ year history of such operations, while at the same time, carbon capture had not been applied at a large scale to power generation plants. Taken together, these technologies make up carbon capture AND storage.

An analysis of climate change policy by Deutsche Bank Research captured this divide as follows:

"There is no single industry position on climate change, given the broad and deep divergence among potential losers and winners from both climate change itself, and any regulatory efforts to address the problem in the United States. Debate over the scientific evidence as assembled by the IPCC has given way to disputes over the economic impact of the various intended remedies."

Given the weak industry profile on the climate change issues, it is easy to see how some stakeholders might perceive efforts involving industry to develop CCS and other advanced climate technologies, such as the hydrogen car, as not very promising in the near-term.

A.1.6 Federal agency response

At the time of the proposed Carson project, federal action to encourage commercial deployment had begun. Under the USDOE's RCSP Program, seven regional partnerships had been established in 2003. Approximately 20 regional demonstration projects had scheduled nationwide, beginning in 2005. Although these were primarily small-scale tests sequestering a few thousand tons, their activities served to increase awareness and involvement by a wide range of stakeholders. Among these was the WESTCARB partnership, which included California among its partner states.

⁵⁵ NPR, Morning Edition, U.S. Eyes Burying CO₂ to Battle Climate Change, October 4, 2004, accessed July 3, 2010 at: <http://www.npr.org/templates/story/story.php?storyId=3917655>

Appendix 2 – Interview guide

Discuss informed consent with participant and ask to sign and return letter. Notify participants that they can stop the interview at any time. Notify and receive consent from participant that the interview will be audio-recorded.

1. Tell me a little about you, your prior experience and what brought you to the project?
2. [For those related to project INDUSTRY, GOVERNMENT, RESEARCHERS ETC]
What was your specific role in relation to the project XX? Why did you get involved in that role?

OR

[For others in the community: LOCAL COMMUNITY NGO's OTHERS ETC]
How and when did you first hear about the project?
3. How would you describe your relationship to the local community?
 - a. If multi-generational, going how far back?
 - b. Do you own, rent, or work in the subject community?
 - c. How long have you been in the community?
4. How would you describe/(characterize) the/your local community?
 - a. Close knit, rural, urban, in decay, vibrant, etc - can you provide some examples that demonstrate this?
5. What do you know about sequestration/carbon capture and storage - what is your level of expertise, experience with CCS (country specific)?
6. Did you know about sequestration/carbon capture and storage before or after learning about the project in your community? (LESS LIKELY TO BE ASKED OF PROJECT PERSONNEL, GOVERNMENT ETC)
7. What were the benefits that the developers communicated about the project?
 - a. How were they presented?
8. What do you think were the benefits of the project to the/your community?
9. How did the community perceive the benefits?
10. What do you believe were the main questions/issues raised by stakeholders in the community?
11. What is the community perception of the project developer?
12. Was community engagement a project priority? How was the community engaged? What information was presented about the project?
13. Can you think of an event or circumstance when things related to the project and how the public viewed it went very well?
14. Can you think of an event or circumstance when things related to the project and how the public viewed it went poorly?
15. Was there a particular event that marked a change in the level of public acceptance towards the project?
 - a. What happened?
 - b. [If INTERVIEWEE IS RELATED TO PROJECT]: How did you respond?
16. What other information would stakeholders have liked to have heard or seen?
 - a. Were there any unanswered questions?

Ask participants if they are willing to provide educational background information, how long lived in community, and other information they believe might be important to understanding their role in the community.